

ABSTRACT

Objects of the present invention are to reduce the number of optical filters, and to improve crosstalk characteristics of periodic optical filters. WDM signals are converted into vestigial-side-band signals collectively using a periodic optical filter. As an example, light signals having odd number wavelengths (wavelengths λ_1 , λ_3 , λ_5) and light signals having even number wavelengths (wavelengths λ_2 , λ_4 , λ_6) are wavelength-multiplexed in the first optical wavelength multiplexer, and are then filtered by a periodic narrow band-pass optical filter to convert the light signals into vestigial-side-band (VSB) signals. Then, the vestigial-side-band signals are combined by the second optical wavelength multiplexer. Such an interleave configuration enables suppression of crosstalk caused by adjacent channels.